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FOR RELEASE

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For ICU Patients, Nighttime Extubations Associated With Higher Mortality

ATS 2016, SAN FRANCISCO – Adult patients who were admitted to U.S. intensive care units had higher mortality if they were extubated overnight. The results reported at the ATS 2016 International Conference may discourage hospital administrators from expanding the practice of overnight extubations in ICUs, which the lead author noted are rapidly being transformed to provide continuity of care.

“Overnight extubations is of specific relevance today as physician presence in U.S. ICUs overnight (either onsite or remotely) is increasing,” said Hayley Gershengorn, MD, lead author and assistant professor at Albert Einstein College of Medicine and attending physician at Montefiore Medical Center in New York City. “One of the goals of this movement has been to transform ICUs into truly ‘24 hour operations’ in which the same level of care is available throughout the day. Our results demonstrate more information is needed before we can say it is in our patients’ best interest to make extubation a service we provide all of the time.”

The researchers completed a retrospective study comprising 32,760 patients admitted to 76 ICUs, where they received mechanical ventilation to help them breathe. One-fifth of the patients in the study (18.2 percent) were extubated overnight, which the researchers defined as between 7:00 p.m. and 6:59 a.m. Patients who were extubated overnight were typically diagnosed with cardiovascular disease, sepsis, trauma or other neurologic disease. Among ICU admissions, mortality rates were 28.2 percent in patients who were extubated overnight and 15.9 percent in patients who were extubated during the day.

This study is believed to be the first to investigate the frequency of overnight extubations in the U.S. “Our results raise concern that this practice may be harmful,” cautioned Dr. Gershengorn.

“Prospective studies are needed to evaluate this issue further. Specifically interesting will be the results of such prospective investigations on patient subgroups as there may well be some patients – for example surgical patients with short durations of mechanical ventilation – in whom overnight extubation is safe and effective.”

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Abstract 6193

Nighttime Extubations Are Associated with Worse Outcomes for U.S. Intensive Care Unit Patients

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Abstract Body

Rationale

Little is known about the timing of extubations across U.S. intensive care units (ICUs). A single center study found patients extubated overnight had a lower likelihood of reintubation and had similar rates of hospital mortality compared to those extubated during the day. Whether this finding is generalizable is unknown.

Methods

We performed a retrospective cohort study of mechanically ventilated (MV) adults (age 18+) admitted to U.S. ICUs in the APACHE Outcomes database from 2010 to 2013. We defined “nighttime” as 7:00pm-6:59am. Using standard summary statistics, we evaluated patient characteristics associated with and frequency of nighttime extubations across ICUs; using multilevel multivariate regression analyses (clustered by individual ICU), we identified factors associated with extubation overnight. Finally, we created propensity-matched pairs of patients extubated during the nighttime vs daytime (with MV duration ≥ 12 hours) and compared outcomes—rates of reintubation, ICU/hospital mortality, and ICU/hospital length of stay (LOS)—using Chi square and Mann-Whitney U tests.

Results

Our cohort consisted of 32,760 patients across 76 ICUs; 5,965 (18.2%) were extubated overnight. Rates of nighttime extubation varied across ICUs (median (interquartile range): 15.2% (10.1-20.6%)). Patients extubated at night were more commonly elective surgery patients (35% of nighttime vs. 19% of daytime, $p < 0.001$), had primarily cardiovascular diagnoses (35% vs. 21%, $p < 0.001$), and had MV duration < 12 hours (50% vs. 17%, $p < 0.001$). After multivariable adjustment, patient factors associated with nighttime extubation were: diagnosis of cardiovascular disease, sepsis, trauma, or neurologic disease (compared to respiratory disease);

higher acute physiology score; absence of MV on ICU admission; and MV duration <12 hours. We created 2,963 propensity-matched pairs who were well balanced on baseline characteristics (Table). Patients extubated overnight were more commonly reintubated within 24 (5.1% vs. 3.4%, $p=0.001$) and 48 hours (6.0% vs. 4.8%, $p=0.033$), but not at any time (7.9% vs. 7.4%, $p=0.46$). Mortality was higher in patients extubated overnight (ICU: 28.2% vs. 15.9%, $p<0.001$; hospital: 32.9% vs. 21.0%, $p<0.001$) and LOS was shorter (ICU: 4.0 vs. 4.4 days, $p<0.001$; hospital: 9.3 vs. 10.4 days, $p<0.001$).

Conclusions

Approximately one-fifth of MV patients in U.S. ICUs are extubated overnight. Patients extubated at nighttime are more likely to be reintubated and have higher ICU and hospital mortality than patients extubated during the day.